

# AIR GUN

## BACKGROUND OF THE INVENTION

5           The present invention is related to an improved air gun, and more particularly to an air gun in which the piston rod pushes the right center of the rear block.

Fig. 8 shows an air paint bullet gun having a gun body 6 and a gun  
10 handle 7. A striker rod 61 for striking a paint bullet and a gunlock 62 are arranged in the gun body 6. A rear block 63 is disposed at rear end of the gun body 6 for driving the striker rod 61 and the gunlock 62. A barrel 65 is connected with front end of the gun body 6 and communicated with the striker rod 61. A cylinder 64 is mounted on one side of the barrel 65. A piston rod 641  
15 is disposed in the cylinder 64 and connected with a link 642. One end of the link 642 extends along one side of the gun body 6 to connect with the rear block 63 for pushing the same. A trigger 71 is mounted on the gun handle 7. The trigger 71 serves to drive a three-position valve 72 for changing the direction of airflow to operate the piston rod 641 and push the rear block 63.  
20 Accordingly, the striker rod 61 and the gunlock 62 are driven and moved to a chambering and striking position. The trigger 71 controls the gunlock 62 to make the striker rod 61 strike the paint bullet.

The position of the cylinder 64 is limited by the barrel 65 so that the link  
25 642 must be disposed on one side of the gun body 6 as shown in Fig. 9. Accordingly, the link 642 only pushes single side of the rear block 63. As a result, the force is simply applied to one side of the rear block 63 so that the

striker rod 61 driven by the rear block 63 to axially move within the chamber of the gun will be deflected. Therefore, the striker rod 61 will abrade single side of the chamber. After a period of use, the chamber will be bored. This will lead to wear of the striker rod 61 which quickly reciprocally move. This will  
5 also affect the airtight effect between the chamber and the striker rod 61 and lead to insufficient shooting force applied to the paint bullet.

Furthermore, the cylinder 64, the piston rod 641 and the link 642 are exposed to outer side of the gun body 6 and the paint bullet gun is generally  
10 used outdoors. Therefore, the cylinder 64, the piston rod 641 and the link 642 tend to be collided by alien article and deformed. Once the cylinder 64, the piston rod 641 or the link 642 is deformed, the rear block 63 cannot be pushed and the gun will malfunction.

15 Besides, the position of the cylinder 64 is limited by the barrel 65 so that the cylinder 64 must be disposed on one side of the gun body 6. Therefore, the middle section of the link 642 must be bent and then connected to the rear block 63. Accordingly, when assembled, a connecting tube 643 must be screwed between the link 642 and the piston rod 641. This leads to  
20 inconvenience in manufacturing and difficulty in assembly. As a result, the manufacturing cost is increased.

## SUMMARY OF THE INVENTION

It is therefore a primary object of the present invention to provide an  
25 improved air gun including a main body. A striker rod for striking paint bullet and a gunlock for controlling the striker rod are longitudinally arranged in the main body in parallel to each other. The striker rod and the gunlock are driven

by a rear block. The rear block is pushed by a thruster disposed in the main body. A controlling valve is disposed at front end of the main body for controlling direction of airflow. The controlling valve is connected with several pipelines for connecting with an air source and the thruster. A trigger is  
5 arranged under the bottom of the main body for controlling the direction of airflow of the controlling valve and the strike of the gunlock. The thruster is mounted in the main body right at the center of the rear block. The thruster includes a piston rod that is controlled by the controlling valve and axially movable out of the main body. One end of the piston rod extending out of the  
10 main body is right fixedly connected with the center of the rear block. The thruster is mounted in the main body right at the center of the rear block. Therefore, the piston rod of the thruster will push the right center of the rear block so that the rear block is evenly forced to smoothly drive the striker rod. Therefore, the wear between the striker rod and the upper air chamber is  
15 avoided. Also, the air chamber will not be bored so that the airtight effect will not be affected.

It is a further object of the present invention to provide the above air gun in which thruster is mounted in the main body and protected by the main  
20 body. Therefore, during activity, the piston rod of the thruster for pushing the rear block will not be collided by alien article and deformed. Accordingly, the shooting operation can be ensured.

It is still a further object of the present invention to provide the above  
25 air gun in which the piston rod of the thruster pushes the right center of the rear block so that the piston rod straightly linearly pushes the rear block without additionally connecting with a bent link as in the conventional paint

bullet gun. This facilitates manufacturing of the air gun.

The present invention can be best understood through the following description and accompanying drawings wherein:

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## BRIEF DESCRIPTION OF THE DRAWINGS

Fig. 1 is a perspective view of a first embodiment of the present invention;

10 Fig. 2 is a sectional view taken along line 2-2 of Fig. 1;

Fig. 3 is a side partially sectional view of the first embodiment of the present invention, showing the thruster thereof;

Fig. 4 is a top partially sectional view of the first embodiment of the present invention;

15 Fig. 5 is a view according to Fig. 4, showing that the thruster pushes the rear block;

Fig. 6 is a partially sectional view of a second embodiment of the present invention;

20 Fig. 7 is a partially sectional view of a third embodiment of the present invention;

Fig. 8 is a perspective view of a conventional paint bullet gun; and

Fig. 9 is a top view of the conventional paint bullet gun, showing that the link pushes single side of the rear block.

## 25 DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

Please refer to Figs. 1 to 4. The air gun of the present invention includes

a main body 1 formed with an upper air chamber 11 and a lower air chamber 12 that are longitudinally arranged in parallel to each other. A striker rod 2 for striking the paint bullet and a gunlock 21 for controlling the striker rod 2 are respectively disposed in the upper and lower air chambers 11, 12. The striker rod 2 and the gunlock 21 are driven by a rear block 22 positioned at rear end of the main body 1. The rear block 22 is pushed by a thruster 3 disposed in the main body 1 between the striker rod 2 and the gunlock 21. A controlling valve 13 is disposed at front end of the main body 1 for controlling direction of airflow. In this embodiment, the controlling valve 13 is an electromagnetic valve. The controlling valve 13 is connected with several pipelines 131 for connecting with an air source (not shown) and the thruster 3. A gun handle 14 is arranged under the bottom of the main body 1. A trigger 141 is disposed on the gun handle 14 for controlling the direction of airflow of the controlling valve 13 and the strike of the gunlock 21.

The thruster 3 is mounted in the main body 1 right at the center of the rear block 22. In this embodiment, the thruster 3 includes a cylinder 31 disposed in the main body 1 right at the center of the rear block 22 and a piston rod 32 axially movable within the cylinder 31. The cylinder 31 is positioned between the upper and lower air chambers 11, 12. One end of the piston rod 32 positioned in the cylinder 31 has a piston 321. The other end of the piston rod 32 extending out of the cylinder 31 is right fixedly connected with the center of the rear block 22. Two ends of the cylinder 31 are respectively formed with two vents 33. Two sides of the main body 1 are respectively formed with two channels 15 extending to the vents 33. The vents 33 radially respectively communicate with the channels 15. The pipelines 131 of the controlling valve 13 extend along the channels 15 to connect with the

vents 33. The piston 321 of the piston rod 32 is positioned between the two vents 33 of the cylinder 31.

In use, as shown in Fig. 5, the controlling valve 13 is controlled by the trigger 14, whereby the air coming from the air source goes into the cylinder 31 through the vents 33 at two ends thereof. The air drives the piston rod 32 to move back and forth so as to drive the rear block 22 that further drives the striker rod 2 and the gunlock 21 to continuously move to the chambering and striking position for continuously shooting the paint bullets.

The thruster 3 is mounted in the main body 1 right at the center of the rear block 22. Therefore, the piston rod 32 of the thruster 3 will push the right center of the rear block 22 so that the rear block 22 is evenly forced to smoothly drive the striker rod 2. Therefore, the wear between the striker rod 2 and the upper air chamber 11 is avoided. Also, the air chamber will not be bored so that the airtight effect will not be affected.

Furthermore, the thruster 3 is mounted in the main body 1 and protected by the main body 1. Therefore, during activity, the piston rod 32 of the thruster 3 for pushing the rear block 22 will not be collided by alien article and deformed. Accordingly, the shooting operation can be ensured.

In addition, the piston rod 32 of the thruster 3 pushes the right center of the rear block 22 so that the piston rod 32 straightly linearly pushes the rear block 22 without additionally connecting with a link as in the conventional paint bullet gun. This facilitates manufacturing of the air gun.

Fig. 6 shows a second embodiment of the present invention, in which

the thruster 3 has an air chamber 34 directly formed in the main body 1 right in alignment with the center of the rear block 22. The thruster 3 includes a piston rod 32 disposed in the air chamber 34. The air chamber 34 is positioned between the upper and lower air chambers 11, 12 of the main body 1. One end of the piston rod 32 positioned in the air chamber 34 has a piston 321. The other end of the piston rod 32 extending out of the air chamber 34 is right fixedly connected with the center of the rear block 22. Two ends of the air chamber 34 are respectively formed with two vents 33 for connecting with the pipelines 131 of the controlling valve 13.

The air chamber 34 is directly formed in the main body 1 instead of the cylinder 31. This can achieve the same effect as the first embodiment and the components of the air gun are simplified.

In the above embodiments, the pipelines 131 of the controlling valve 13 extend along the channels 15 of two sides of the main body 1 to connect with the vents 33 of the thruster 3. Alternatively, two passages 16 can be directly formed in the main body 1 as shown in Fig. 7 which shows a third embodiment of the present invention. One end of each passage 16 is connected with the vent 33, while the other end of the passage 16 is connected with the pipeline 131 of the controlling valve 13. Accordingly, the air can be also conducted into the thruster 3 for driving the piston rod 32. Furthermore, the passages 16 are hidden in the main body 1 so that the appearance of the main body 1 is beautified.

The above embodiments are only used to illustrate the present invention, not intended to limit the scope thereof. Many modifications of the above

embodiments can be made without departing from the spirit of the present invention.